THAT WHICH IS CLAIMED:

1. A method of maneuvering an exit vehicle departing from a rotating space vehicle, the method comprising the steps of:

determining a composite spin axis of the space vehicle to define a plurality of spin axis planes that are perpendicular to the composite spin axis, wherein an exit flight path of the exit vehicle is defined in the plurality of spin axis planes;

determining a spin rate of the rotating space vehicle about the composite spin axis;

launching the exit vehicle from the space vehicle with a departure velocity, wherein the departure velocity includes a V_S component defined in the plurality of spin axis planes; and

applying a lateral thrust to the exit vehicle that is generally orthogonal to the V_S component of departure velocity to provide a lateral acceleration, wherein the lateral acceleration is defined in the spin axis plane, and wherein the lateral acceleration provides a turn rate of the exit vehicle's V_S component in the spin axis plane about the composite spin axis that is proportionate to the spin rate of the rotating space vehicle.

2. A method according to Claim 1 wherein determining the composite spin axis of the space vehicle comprises determining a root-sum-square of angular velocities of the space vehicle about all three space vehicle axes.

3. A method according to Claim 1 wherein launching the exit vehicle provides a departure velocity that remains constant along the exit flight path.

4. A method according to Claim 1 wherein launching the exit vehicle provides a departure velocity that increases along the exit flight path.

5. A method according to Claim 1 wherein launching the exit vehicle provides a linear exit trajectory in space vehicle coordinates in a direction of the departure velocity.

6. A method according to Claim 1 wherein applying the lateral thrust provides a turn rate of the exit vehicle's V_S component in the spin axis plane that is proportionate to the spin rate of the rotating space vehicle such that the turn rate is

equal to the spin rate of rotating space vehicle, such that the exit vehicle turns in synchronization with the rotating space vehicle.

7. A method according to Claim 1 wherein applying the lateral thrust provides a turn rate of the exit vehicle's V_S component in the spin axis plane that is faster than the spin rate of the rotating space vehicle.

8. A method according to Claim 1 wherein applying the lateral thrust provides a turn rate of the exit vehicle's V_S component in the spin axis plane that is slower than the spin rate of the rotating space vehicle.

9. An apparatus for maneuvering an exit vehicle departing from a rotating space vehicle, the apparatus comprising:

processing circuitry for: (i) determining a composite spin axis of the space vehicle to define a plurality of spin axis planes that are perpendicular to the composite spin axis, wherein an exit flight path of the exit vehicle is defined in the plurality of spin axis planes; and (ii) determining a spin rate of the rotating space vehicle about the composite spin axis;

launch mechanism for: (iii) launching the exit vehicle from the space vehicle with a departure velocity, wherein the departure velocity includes a V_S component defined in the plurality of spin axis planes; and

thruster device for: (iv) applying a lateral thrust to the exit vehicle that is generally orthogonal to the V_S component of departure velocity to provide a lateral acceleration, wherein the lateral acceleration is defined in the spin axis plane, and wherein the lateral acceleration provides a turn rate of the exit vehicle's V_S component in the spin axis plane about the composite spin axis that is proportionate to the spin rate of the rotating space vehicle.

10. An apparatus according to Claim 9 wherein the processing circuitry determines a root-sum-square of angular velocities of the space vehicle about all three space vehicle axes to determine the composite spin axis of the space vehicle.

11. An apparatus according to Claim 9 wherein the launch mechanism provides a departure velocity that remains constant along the exit flight path.

12. An apparatus according to Claim 9, further comprising a thruster device for increasing the departure velocity along the exit flight path.

13. An apparatus according to Claim 9 wherein the launch mechanism provides a linear exit trajectory in space vehicle coordinates in a direction of the departure velocity when launching the exit vehicle.

14. An apparatus according to Claim 9 wherein the thruster device applies the lateral thrust to provide a turn rate of the exit vehicle's V_S component in the spin axis plane that is proportionate to the spin rate of the rotating space vehicle such that the turn rate is equal to the spin rate of rotating space vehicle, such that the exit vehicle turns in synchronization with the rotating space vehicle.

15. An apparatus according to Claim 9 wherein the thruster device applies the lateral thrust to provide a turn rate of the exit vehicle's V_S component in the spin axis plane that is faster than the spin rate of the rotating space vehicle.

16. An apparatus according to Claim 9 wherein the thruster device applies the lateral thrust to provide a turn rate of the exit vehicle's V_S component in the spin axis plane that is slower than the spin rate of the rotating space vehicle.

17. A computer program product for maneuvering an exit vehicle departing from a rotating space vehicle, the computer program product comprising a computer-readable storage medium having computer-readable program instructions stored therein, the computer-readable program portions comprising:

a first executable portion for determining a composite spin axis of the space vehicle to define a plurality of spin axis planes that are perpendicular to the composite spin axis, wherein an exit flight path of the exit vehicle is defined in the plurality of spin axis planes;

a second executable portion for determining a spin rate of the rotating space vehicle about the composite spin axis;

a third executable portion for launching the exit vehicle from the space vehicle with a departure velocity, wherein the departure velocity includes a V_S component defined in the plurality of spin axis planes; and

a fourth executable portion for applying a lateral thrust to the exit vehicle that is generally orthogonal to the V_S component of departure velocity to provide a lateral acceleration, wherein the lateral acceleration is defined in the spin axis plane, and wherein the lateral acceleration provides a turn rate of the exit vehicle's V_S component in the spin axis plane about the composite spin axis that is proportionate to the spin rate of the rotating space vehicle.

18. A computer program product according to Claim 17 wherein the first executable portion is further capable of determining a root-sum-square of angular velocities of the space vehicle about all three space vehicle axes to determine the composite spin axis of the space vehicle comprises.

19. A computer program product according to Claim 17 wherein the third executable portion is further capable of providing a departure velocity that remains constant along the exit flight path.

20. A computer program product according to Claim 17 wherein the third executable portion is further capable of providing a departure velocity that increases along the exit flight path.

21. A computer program product according to Claim 17 wherein the third executable portion is further capable of providing a linear exit trajectory in space vehicle coordinates in a direction of the departure velocity.

22. A computer program product according to Claim 17 wherein the fourth executable portion is further capable of providing a turn rate of the exit vehicle's V_S component in the spin axis plane that is proportionate to the spin rate of the rotating space vehicle such that the turn rate is equal to the spin rate of rotating space vehicle, such that the exit vehicle turns in synchronization with the rotating space vehicle.

23. A computer program product according to Claim 17 wherein the fourth executable portion is further capable of providing a turn rate of the exit vehicle's V_S component in the spin axis plane that is faster than the spin rate of the rotating space vehicle.

24. A computer program product according to Claim 17 wherein the fourth executable portion is further capable of providing a turn rate of the exit vehicle's V_S component in the spin axis plane that is slower than the spin rate of the rotating space vehicle.